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Synthesis , Characterization and Evaluation of Some Polyol Esters as Synthetic Lubricating Base Oils

A Thesis Submitted by

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For the Degree of Ph.D. in Chemistry

To

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Contents

Published Paper.....	
List of Abbreviations.....	i
List of Tables.....	ii
List of Figures.....	iii
Aim of work.....	vi
Abstract.....	ix
Summary.....	a
1.INTRODUCTION.....	1
1.1. Lubrication.....	1
1.1.1..Boundary lubrication	2
1.1.2..Elastohydrodynamic lubrication.....	3
1.1.3..Full fluid-film lubrication	4
1.2.Lubricating oils	4
1.3.Lubricant Types	6
1.3.1.Mineral oils.....	6
1.3.2.Synthetic lubricants.....	12
1.3.2.1. Viscosity Index (VI).....	13
1.3.2.2.Pour point and low temperature viscosities.....	14
1.3.2.3. Thermal oxidative stability.....	14
1.3.2.4. Volatility.....	15
1.3.3.Semi-synthetic Oils.....	17
1.3.4.Bio-based Oils.....	18
1.4.Synthetic Lubricant Base stocks	19
1.4.1Poly-Alpha-Olefins (PAO's)	19
1.4.2.Alkylbenzenes.....	23

1. 4.3.Polyalkylene Glycols (PAGs)	25
1.4.4Phosphate Esters.....	28
1.4.5.Silicone Fluids	30
1.4.6. Dibasic acid Esters	31
1.4.7.Polyol Esters	33
1.4.8..Complex esters	39
1.5.Applications For Synthetic Lubricants.....	42
2. EXPERIMENTAL.....	48
2.1 Materials.....	48
2.1.1. Acids.....	48
2.1.2. Alcohols.....	49
2.1.3. Catalyst	52
2.1.4. Solvents.....	53
2.1.5.Auxiliary chemicals.....	53
2.2.Procedures.....	53
2.2.1.Preparation of mono esters	53
2.2.2.Synthesis of complex esters.....	54
2.3. Characterization of the prepared compounds.....	58
2.3.1. Infra-Red spectroscopic analysis.....	58
2.3.2.Determination of molecular weight of prepared compounds.....	58
2.3.3. ¹ H-NMR spectroscopic analysis.....	58
2.3.4. Thermogravimetric analysis.....	59
2.3.5. Total acid number (TAN).....	59
2.3.6. Rheology properties of complex esters (MCR).....	59
2.4. Evaluation of the prepared compounds as synthetic base lubricant.....	61
2.4.1. Determination of Viscosity index	61

. 2.4.2. Pour point measurments	63
. 2.4.3. Flash point measurments	64
3. RESULTS AND DISCUSSION.....	65
3.1. Preparation of complex esters	66
. 3.2. Structure confirmation of the prepared compounds.....	68
3.2. 1.FTIR	68
3.2.2. ¹ H-NMR Spectroscopy.....	75
3.2.3. Mass spectrum of the prepared complex esters.....	79
3. 3. Total acid number of the prepared complex esters.....	85
. 3.4. Thermal Stability of The prepared complex esters	87
. 3.5 . Rheology and tribology properties of the prepared compounds	92
.3.6.Evaluation of the synthetic esters in relation to their chemical structure.....	97
. 3.6.1.Effect of chain length of the dibasic acids.....	98
3.6.2.Effect of alcohol alkyl chain.....	99
3.6.3. Effect of the number of hydroxyl groups of the polyhdric alcohols used.....	100
4.CONCLUSION.....	117
5.REFERENCES.....	119
Arabic Summary.....	1

List Of Abbreviations

Flash Point	FP
Fourier Transform Infrared Spectroscopy	F.T.I.R
Modeular Compact Rhemoter	MCR
Mass Spectrum	MS
Neopentyl Glycol	NPG
Pour Point	PP
Poly Alpha Olefins	PAO
Polyalkylene Glycols	PAGs
Proton Nuclear Magnetic Resonance	¹ H-NMR
Thermogravmetric analysis	TGA
Total Acid Number	TAN
Trimethylol propane	TMP
Viscosity Index	VI

List of Tables

Table 1 :The Designation of Prepared Mono Ester(First group).....	55
Table 2 : The Designation of Prepared mono Ester(Second Group).....	55
Table 3 : The Designation of Prepared monoEster(Third Group).....	56
<u>Table 4.:The Designation of Prepared Complex Este (First Group).....</u>	<u>56</u>
<u>Table 5:The Designation of Prepared Complex Ester(second Group).....</u>	<u>57</u>
Table 6:The DesignationofPreparedComplexEster(Third Group).....	57
Table 7 : The Mass Spectrum of Prepared Complex Ester(First Group).....	83
Table 8 : The Mass Spectrum of Prepared Complex Ester(second Group).....	84
Table 9 : The Mass Spectrum of Prepared Complex Ester(Third Group).....	84
Table 10: Total acid number of first group.....	85
Table 11: Total acid number of secondgroup.....	86
Table 12:Total acid number of third group.....	87
<u>Table 13: Physico-Chemical Characteristics of Prepared Complex Ester (First group)</u>	<u>102</u>
<u>Table 14: Physico-Chemical Characteristics of Prepared Complex Ester (Second group).....</u>	<u>103</u>
<u>Table 15: Physico-Chemical Characteristics of Prepared Complex Ester (Third group).....</u>	<u>104</u>
Table 16:.Comparative study for the prepared complex esters and the commercial sample.....	116

List of Figures

Figure(1) : Homopolymer structure of polyalkyleneglycol.....	28
Figure (2):Steps of diester reaction.....	33
Figure (3):Common polyol esters.....	39
Figure(4): Rhemeter MCR 502.....	60
Figure (5) :The apparatus used for measuring pour point.....	63
Figure (6) :The apparatus used for measuring Flash point.....	64
Figure (7) : FTIR Spectrum of Mono EsterMA.....,,.....	69
Figure (8):FTIR Spectrum of Mono EsterSA.....	69
Figure (9):FTIR Spectrum of Mono EsterAA.....	70
Figure (10):FTIR Spectrum of Mono EsterAO.....	70
figure (11):FTIR Spectrum of Complex Ester AAT.....	71
Figure (12):FTIR Spectrum of Complex Ester MAN.....	71
Figure (13):FTIR Spectrum of Complex Ester MOT.....	72
Figure (14):FTIR Spectrum of Complex Ester SAT.....	73
Figure (15):FTIR Spectrum of Complex Ester SON.....	73
Figure (16):FTIR Spectrum of Complex Ester SOT.....	74
Figure (17):FTIR Spectrum of Complex Ester AHN.....	74

Figure (18):FTIR Spectrum of Complex Ester AEN.....	75
Figure (19):- ¹ H-NMR Spectrum of Mono Ester AE.....	77
Figure (20):- ¹ H-NMR Spectrum of Mono Ester AA.....	77
Figure (21):- ¹ H-NMR Spectrum of Complex Ester AET.....	78
Figure (22):- ¹ H-NMR Spectrum of Complex Ester AAT.....	78
Figure (23):Mass Spectrum of Complex Ester MEN.....	81
Figure (24):Mass Spectrum of Complex Ester AEN.....	81
Figure (25):Mass Spectrum of Complex Ester MON.....	82
Figure (26):Mass Spectrum of Complex Ester AAT.....	82
Figure (27):TGA of Complex Ester MEN.....	89
Figure (28):TGA of Complex Ester AEN.....	89
Figure (29):TGA of Complex Ester MON.....	90
Figure (30):TGA of Complex Ester AAT.....	90
Figure (31): TGA of The First group.....	91
Figure (32):TGA of The Second group	91
Figure (33):-TGA of The Thrid group	92
Figure (34):-Flow Curve of MON.....	93
Figure (35):-Flow Curve of MOT.....	93

Figure (36):-Flow Curve of SON.....	94
Figure (37):-Flow Curve of SOT.....	94
Figure (38):-Flow Curve of AON.....	95
Figure (39):-Flow Curve of AOT.....	95
Figure (40):-Coefficient of friction (COF) versus sliding velocity for products (MOT and AOT).....	96
Figure (41):Effect Chain Length of Dibasic acid on VI.....	105
Figure (42):Effect Chain Length of Dibasic acid on Viscosity at100 °C.....	105
Figure (43):Effect Chain Length of Dibasic acid on VI.....	106
Figure (44):Effect Chain Length of Dibasic acid on FP.....	106
Figure (45):Effect Chain Length of Dibasic acid on PP.....	107
Figure (46):Effect of alcohol alkyl chain on VI(a,b,c,d,e and f).....	110
Figure (47):Effect of alcohol alkyl chain on FP(a and b).....	111
Figure (48):Effect of alcohol alkyl chain on pp.....	111
Figure (49):Effect of hydroxyl groups number on VI(a,b and c).....	113
Figure (50):Effect of hydroxyl groups number on FP(a,b and c).....	114
Figure (51):Effect of hydroxyl groups number on pp.....	115

Aim of work

The present work deals with preparation of complex esters and their use as synthetic base lubricating oils replacing mineral oils. Preparation of new complex ester by using new catalyst Amberlyst 15 (ion exchange resin), the use of non conventional catalyst yields the derived products with negligible free acidity. The process has superiority with respect to easy handling, less reaction time, lower molar ratio of acid to alcohol, energy saving and verifying yields of the order of 95% and above. Another advantage of these catalysts is that they can be recycled and used without loss of reactivity or decrease in yield. The advantages of complex esters are wide of viscosity range, high thermal and oxidative stability, high film thickness, surface activity, good biodegradability and low toxicity. They are active substitute for mineral oils. Engines in the contemporary time become a high-performance of which requires an oil sophisticated keep pace with

this development. capable oils to keep up with this development is the synthetic oils where mineral oils may not go along with this development .This is reflected well in the field of aviation which works by synthetic lubricating oils. Synthetic lubricating oils play an important role in the economies of the state in terms of their uses and important vitals where are used in special packaging conserved food which be used by man in his daily life. Nuclear stations does not fit the traditional use of mineral oils due to the presence of gamma rays that break the components of mineral oils causing problems, therefore it is necessary to use synthetic lubricating oils rather than these minerals. The stability of synthetic lubricating oils ordered them as the superior.

To achieve this goal, this work involved the following steps:

1-Esterification of dibasic acid with alkanols (amyl, 2-ethyl hexanol,hexanol and octanol.) by using new catalyst Amberlyst 15 (ion exchange resin).